Superfund Program Proposed Plan

U.S. EPA Region 6

Hart Creosoting Company
Jasper County, Texas

July 26, 2006

A. INTRODUCTION

EPA Announces Proposed Plan

This Proposed Plan (PPL) identifies the Preferred Alternative for cleaning up the contaminated soil, sediment and ground water at the Hart Creosoting Company (HCC) Site and provides the rationale for this preference. In addition, this PPL includes summaries of other cleanup alternatives evaluated for use at the HCC site (the Site). This document is issued by the U.S. Environmental Protection Agency (EPA), the lead agency for the Site activities, and the Texas Commission on Environmental Quality (TCEQ), the support agency. EPA, in consultation with the TCEQ, will select a final remedy for the Site after reviewing and considering all information submitted during the 30-day public comment period. EPA, in consultation with the TCEQ, may modify the Preferred Alternative or select another response action presented in this PPL based on new information or public comments. Therefore, the public is encouraged to review and comment on all alternatives presented in this PPL.

Dates to Remember:
Mark Your Calendar

<u>Public Meeting- August 15, 2006</u>

The U.S. EPA will hold a Public Meeting on Tuesday August 15, 2006 to explain the results of the sampling investigation and to discuss the proposed plan. The meeting will be held at the First National Bank located at 301 E. Houston Street, Jasper TX from 6:00 p.m. - 8:00 p.m. Phone No. (409) 384-3486.

Public Comment Period:
July 26, 2006 - August 25, 2006

For more information, see the Administrative Record at the following location:

Jasper Public Library	U.S. EPA Region 6
175 E. Water Street	1445 Ross Avenue
Jasper, TX 75951	Dallas, TX 75202
(409) 384-3791	(214) 665-6548
Hours: Mon-Fri	Hours: Mon-Fri
10:00 a.m. - 6:00 p.m.	8:30 a.m. - 4:00p.m.

EPA is issuing this PPL as part of its public participation responsibility under Section 300.430 (f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This PPL summarizes information that can be found in greater detail in the August 2006 Remedial Investigation and Feasibility Study (RI/FS) Report and other documents contained in the Administrative Record file for the Site. EPA and the State encourage the public to review these documents to gain a more comprehensive understanding of the Site and Superfund activities that have been conducted at the Site.

B. BACKGROUND/SITE HISTORY

The Site is a former creosote-based wood treating facility located in east Texas, approximately 130 miles northeast of Houston on the west side of State Highway 96 and approximately 1 mile south of the City of Jasper (Figure 1). Wood treatment operations were performed at the Site for more than thirty years, beginning in the late 1950s, using a steam preconditioning and pressurized creosote process. Historic documents for the Site establish that creosote waste from treatment operations were managed in six unlined surface impoundments or ponds, dating from the earliest site operation. The six ponds were reconfigured into four ponds identified as Ponds A, B, C and D/E (Figure 1) in the late 1970s and used until the 1980s, prior to closure under Texas Water Commission (TWC) oversight. Creosote wastes generated following pond closure were treated in an onsite wastewater treatment system before discharging to the City of Jasper publicly owned treatment works (POTW).

Other processes performed at the Site included a saw mill that operated during the 1950s, a pole peeling plant that operated from the late 1960s to the late1970s, and a pipe threading shop that operated during the early 1980s.

Potential contaminant sources present at the Site included a drip pad, deteriorating above-ground storage tanks (ASTs), contaminated treatment cylinders, wastewater holding tanks, cooling towers, treated wood storage areas, and contaminated soil and ground water associated with historic spills and waste management practices.

STATE AGENCY ACTIONS

In October 1984, in response to a compliance agreement with the Texas Department of Water Resources (TDWR), HCC initiated a program to assess the impacts of past waste management practices on ground water quality. Work performed between October 1984 and July 1986 included:

- Preparation and implementation of a waste analysis plan in November 1984 to characterize wastewater and sludge present in Ponds A to D and in soil beneath the ponds.
- A hydrogeologic investigation in July 1985 that included drilling three soil borings and construction of three monitor wells to complement three existing wells installed in 1977.
- An expanded hydrogeologic investigation in July 1986 to add six new wells to the ground water monitoring network.

Numerous soil, ground water, surface water, and sediment sampling events were performed by Texas regulatory agencies following the Site's closure in 1993. Chemicals of concern (COCs) identified in the contaminated soil, sediment, ground water and surface water include polycyclic aromatic hydrocarbons (PAHs) and semi-volatile organic compounds (SVOCs).

U.S. EPA ACTIONS

Removal Action- In 1995, EPA performed a time-critical removal action to drain the four ponds and stabilize the remaining sludge. Sludge and visibly contaminated soil were consolidated and placed in an onsite, natural clay-lined temporary waste cell (WC). A clay cover was placed over the WC and seeded with grass for erosion control.

***RCRA Facility Assessment* -** In 1998, a preliminary review – visual site inspection (PR/VSI) was conducted under EPA's contract. The overall purpose for the work was to identify potential solid waste management units (SWMUs) and areas of concern (AOC) that might have released hazardous constituents that could pose a threat to human health and the environment. The PR/VSI identified 27

SWMUs and 7 AOCs at the Site and recommended that further investigation be conducted at 10 SWMUs and 4 AOCs.

National Priorities List (NPL) Listing - The HCC Site was proposed to the NPL on April 23, 1998, based on a Hazard Ranking System (HRS) score of 48.3. The NPL listing was finalized on July 22, 1999. The Site's Comprehensive Environmental Response, Compensation, and Liability Act Inventory Superfund Site (CERCLIS) identification number is TXD050299577.

Engineering Evaluation and Cost Analysis (EE/CA) - An EE/CA was conducted between December 2000 and January 2001 under EPA's Removal Program. A United States Army Corps of Engineers (USACE) contractor performed the work. The primary focus for the EE/CA field investigation was to determine the extent of contaminated soil remaining in the former process area and the volume and characteristics of contaminated soil placed in the temporary WC, and to assess the impact of historical releases on surface water and sediment downstream of the Site. The EE/CA also included a screening-level risk assessment and evaluation of remedial action alternatives.

Remedial Investigation and Feasibility Study (RI/FS) - A RI/FS was conducted between November 2003 and December 2005 under EPA's Remedial Program. An EPA Response Action Contract (RAC) contractor performed the work. The objective of the RI/FS was to obtain additional information to complement that already obtained through the EE/CA. The RI/FS characterizes the nature and extent of facility-related contaminants. The RI/FS also included a human health risk assessment and a baseline ecological risk assessment.

Supplemental Remedial Investigation (SRI) – A SRI was conducted between February and July 2006 to further characterize the nature and extent of facility-related ground water contaminants. The SRI included sampling the existing ground water monitor wells and installing 4 new monitor wells at locations west and south of the Site. Each well was screened at multiple levels. The SRI data are not available to include in this PPL; however, such will be available and presented in the final RI/FS Report and the final Record of Decision (ROD) and included in the final Administrative Record (AR) for the Site in September 2006.

C. SITE CHARACTERISTICS

SITE ENVIRONMENTAL SETTING

The HCC Site is approximately 23.4-acres in size and lies predominantly within a wooded area with light industrial, commercial, and residential land use. The Site is bounded by densely forested, private commercial property (Temple Inland) to the south and west, commercial property to the north and State Highway 96 to the east. An unnamed tributary flows along the west-southwest Site boundary, converging with Big Walnut Run Creek approximately 1 mile south of the Site (Figure 1).

The Site topography slopes from northeast to southwest, with the ground surface elevation descending from 200 feet mean sea level (msl) in the vicinity of the north property line to 189 feet msl along the bank of unnamed tributary. The WC area is raised between 5 and 10 feet above the ground surface at an elevation of 205 feet msl. Unnamed tributary receives all the surface water runoff from the Site.

The Site is underlain by alluvium composed of varying proportions of clay, silt, and sand size material extending to depths up to 220 feet. The subsurface geology was grouped into three low-permeability and three permeable zones. The low-permeability zones, which are comprised primarily of silt to clay size material, are informally referred to as Zones I-1, I-3 and I-5. Sandwich between the low permeability units are permeable Zones P-2, P-4 and P-6. These units are comprised primarily of sand sized material. Zones I-1 and P-2 are the uppermost units at the Site and were the primary zones of investigation during the RI. Although there is some variability across the Site, Zone I-1 generally occurs at depths between ground surface and 23 feet, and Zone P-2 at depths between 23 and 63 feet. Ground water in Zone P-2 flows in south-southeast direction at an estimated velocity of 52 feet per year.

The HCC Site lies in an area where the Jasper Aquifer intersects the ground surface. The Jasper Aquifer is the sole water supply for the towns of Jasper and Newton, Texas. The nearest active water supply well is the Upper Jasper County Water Authority (UJCWA) newly constructed well #10, located 0.74-mile northwest (upgradient) of the Site. This well is screened at depths between 539 and 820 feet.

A ground water beneficial use classification performed in conjunction with preparation of the RI/FS report concluded that ground water underlying and immediately downgradient of the HCC Site is a Class IIB ground water resource. The Class IIB classification indicates that ground water is not currently being used, but could be used as drinking water in the future.

NATURE AND EXTENT OF CONTAMINATION

Historical operations performed at HCC employed coal tar creosote dissolved in diesel to treat railroad ties and utility poles. Coal tar creosote, a listed hazardous waste (U051), is manufactured through the distillation of coal tar and is the most widely used wood preservative in the United States. It is a thick, oily liquid, typically amber to black in color, with a specific gravity of 1.03 to 1.09. Creosote contains over 300 different chemical compounds. One important group of environmentally significant compounds present in creosote is the PAHs. There are 16 PAHs routinely encountered at wood treating sites, seven of which have been identified as probable human carcinogenic polycyclic aromatic hydrocarbons (CPAHs). Although elevated levels of volatile organic compounds (VOCs) and metals were not expected to be as prevalent in environmental media at the Site, testing was performed on a subset of the soil and sediment samples, and all water samples, to ascertain the significance of these compounds, if present.

Soil and sediment in the temporary WC, the former process area, Pond D/E and unnamed tributary adjacent to the Site contain heavy phase creosote and exhibit high concentrations of PAHs. The heavy phase creosote contaminated soil and sediment as well as the free phase and residual creosote identified in the saturated zone, are considered to be “principal threat waste” because COCs are found at concentrations that pose a significant risk and the leaching of creosote and COCs from the source materials would potentially impact the ground water quality. The low-level threat wastes identified at the Site include the contaminated surface water, ground water, and the light phase creosote contaminated soil and sediment. Although elevated COC concentrations are detected in the low-level threat wastes, the risk levels of concern associated with the low-level threat wastes are not significantly exceeded as defined by EPA’s guidance that defines “principal threat waste”.

WHAT IS A "PRINCIPAL THREAT"?

The NCP established an expectation that EPA will use treatment to address the principal threats posed by a site wherever practical (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, non-aqueous phase liquids (NAPL) in ground water may be viewed as source material. Principal threat wastes are those materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Soil

The RI soil investigation included collection of 20 surface soil and five subsurface soil samples from the non-process areas. In the former process area, located between the waste cell and the unnamed tributary, 40 subsurface soil samples were collected from 20 soil borings. 20 of the 40 samples represented composites of visibly contaminated material collected at depths up to 30 feet. 14 of the 40 samples represented grab samples of visibly clean material taken below the visibly contaminated horizon. The 6 remaining samples represent grabs taken at the base of the visibly contaminated interval. At these six locations refusal conditions prevented the Geoprobe™ boring from advancing through the contaminated interval into the clean soil horizon. One soil boring was advanced into the waste cell during the RI and a composite of visually contaminated material and a grab sample of native soil beneath the waste cell collected.

In addition to the surface and subsurface soil samples collected from the non-process and process areas, a track mounted CPT rig was used to perform continuous sampling in the vicinity of former Pond A to assist in defining the extent of residual NAPL detected in EE/CA borings LIF-1 to LIF-5. Grab samples were retained at 10 foot intervals at depths up to 60 feet from RI borings SB46 to SB50 to correlate visual observations with actual PAH concentrations.

The TPAH and TCPAH concentration ranges in each of the investigation areas are summarized in Table 1.

Ground Water

Ground water was sampled from seven existing monitor wells and nine new monitor wells (Figure 2). Wells MW-1 and MW-2, constructed in 1977, are screened near the base of Zone I-1 and may straddle the Zone I-1 – Zone P-2 contact. Well MW-10B is screened in Zone P-4 and the cross-gradient well MW-8 screened across Zones I-1 to P-6. The remaining 13 monitor wells are screened at varying depths within Zone P-2. Monitor wells MW-1A, MW-2A, MW-6, MW-8 and MW-9 have screen lengths varying from 21 to 115 feet. All other monitor wells have 10 foot long screens.

TABLE 1
Soil Investigation - TPAH and CPAH Concentration Summary
Hart Creosoting Company – Jasper, Texas

Concentration Range				
	Non-Process Area	Former Process Area	Waste Cell	Former Pond A
Surface Soil/Sediment				
No. of Samples	20	0	0	0
TPAH (mg/Kg)	0.03 – 95.7	NA	NA	NA
CPAH (mg/Kg in BaP Eq)	7.2E-07 – 12.2	NA	NA	NA
Subsurface Soil/Soil – Visually Contaminated Interval				
No. of Samples	0	20	5 (EE/CA) (b) 1 (RI) (c)	23
TPAH (mg/Kg)	NA	ND – 8187	284 – 2353 (b) 1027 (c)	3.9 – 16,740
CPAH (mg/Kg in BaP Eq)	NA	0 to 81	3 – 29.5 (b) 16.5 (c)	0 – 104.2
Subsurface Soil – Visually Clean Interval				
No. of Samples	5	20	1	0
TPAH (mg/Kg)	0.03 – 0.11	0.03 – 41.1 2.4 – 18,880 (a)	2.19 (c)	NA
CPAH (mg/Kg in BaP Eq)	0 – 0.008	0 – 0.61 0.001 – 206.4 (a)	0.03 (c)	NA

Notes:

ND = not detected. NA = not applicable

a. Soil borings did not encounter visually clean material. These results are for samples collected at base of visually contaminated interval.

b. Samples collected during EE/CA field sampling event.

c. Sample collected during the RI field sampling event.

Analysis of ground water samples from monitor wells MW-1 and MW-2, installed by HCC in 1977, revealed TPAH concentrations of 0.174 and 65.24 µg/L and TCPAH concentrations of 0.01 and 1.65 µg/L, respectively**.** Ground water samples collected from newly installed wells MW-10A to MW-14A, screened in the upper portions of Zone P-2, yielded TPAH concentrations between 0.26 µg/L and 9110 µg/L with the highest concentration present at MW-13A. TPAH concentrations measured in wells MW-11B to MW-14B, screened in the lower portions of Zone P-2, ranged between 74 and 7119 µg/L, with the highest concentration present at MW-12B. Free creosote product (e.g., NAPL) was also observed in MW-12B at a thickness of approximately 1.5 foot. Although free phase NAPL was observed in only one well (MW-12B) at the bottom of Zone P-2, residual NAPL was identified in a minimum of 3 lithology zones (Zones I-1, P-2 and I-3) at the soil boring locations within the Pond A foot print. The extent of dissolved phase contaminants in Zone P-2 ground water was not determined during the RI, but will be defined by the SRI data.

Only one Zone P-4 monitor well (MW-10B) was installed and sampled. This well is located along the upgradient margin of the former process area. A TPAH concentration of 0.18 µg/L was detected. TPAH concentration detected in the monitor wells, screened between 21 to 115 feet long, ranged between non-detect and 46.64 µg/L, with the highest concentration present at MW-6. These wells are located at locations either up- or cross-gradient from the former process area.

An SRI was conducted between February and July 2006 to further characterize the nature and extent of facility-related ground water contaminants. The SRI data will be available and presented in the final RI/FS Report and the final Record of Decision (ROD) and included in the final Administrative Record (AR) for the Site in September 2006.

Surface Water and Sediment
Surface water samples were collected from one location in Pond D/E, four locations in the unnamed tributary and three locations in Big Walnut Run Creek. A TPAH concentration of 0.52µg/L was detected in the Pond D/E sample, concentrations between 0.13 and 43 µg/L detected in the unnamed tributary and concentrations between 0.189 and 0.198 µg/L measured in the Big Walnut Run samples. TCPAH concentrations were less than 0.1 µg/L at each station except unnamed tributary location UT-SW-02 where a concentration of 0.5 µg/L was reported.

A total of 29 sediment samples were collected from four locations in Pond D/E, ten locations in the unnamed tributary, and three locations in Big Walnut Run Creek. TPAH was detected in the sediment samples at concentrations ranging between 7.5 and 8,062 mg/kg in Pond D/E, between non-detect to 10,110 mg/kg in the unnamed tributary, and between 0.08 mg/kg and 0.008 mg/kg in Big Walnut Run Creek. The highest TPAH and TCPAH concentrations were detected in a sediment sample (UT-SD-NE-03-A) collected in the unnamed tributary at a location adjacent to the process area.

Biota
Two biota tissue samples, benthic invertebrates (crayfish), were sampled during the 2004 RI sampling event. Biota samples were collected at the same downstream stations established on the unnamed tributary where sediment samples UT-SD-03 and UT-SD-04 were collected. Thirteen PAHs were detected or estimated as detected in both tissue samples collected in the unnamed tributary. All the PAH concentrations are below screening values for benthic organisms.

D. SCOPE AND ROLE OF THE RESPONSE ACTION

This response action is the final Site remedy and is intended to address fully the potential threats to human health and the environment posed by the free phase and residual NAPL identified in the saturated zone and the contaminated soil, sediment, surface water, and ground water at the Site. The purpose of this response action is to implement a site-wide strategy for preventing future exposure to the contaminated media and minimizing future migration of COCs from the principal threat wastes (e.g., contaminated soil and sediment) to ground water and down-gradient surface water.

E. SUMMARY OF RISKS

As part of the Remedial Investigation/Feasibility Study (RI/FS), EPA conducted a refined Human Health Risk Assessment (HHRA) and a Baseline Ecological Risk Assessment (BERA) to determine the current and future effects of contaminants on human health and the environment.

The HHRA was performed to quantify the risk associated with potential exposure to site-related contaminants in the following exposure areas and media:

- Upland area soil including the process and non-process areas
- Upland area Pond D/E surface water and sediment
- Unnamed tributary sediment and surface water
- Big Walnut Run Creek surface water, sediment, and fish
- Ground water

Based on current and future expected land use, an industrial worker exposure scenario was selected for the upland process and non-process area soils. To account for possible recreational future use of the non-process area as a soccer venue, EPA also screened the soil data against applicable risk based screening values to protect potential future receptors.

An adolescent recreational exposure scenario was selected for Pond D/E, the unnamed tributary and Big Walnut Run Creek sediment and surface water, the Big Walnut Run Creek fish, and an adult and child residential exposure scenario selected for ground water.

The HHRA scenario (Table 2) indicates unacceptable risks related to PAHs and some other COCs for the following exposure scenarios:

- Cumulative excess lifetime cancer risk (ELCR) for adolescent recreational exposure to sediment in Pond D/E exceeds EPA's acceptable risk level of 1×10^{-4}.

- Cumulative ELCR for adolescent recreational exposure to sediment in the unnamed Tributary exceeds EPA's acceptable risk level of 1×10^{-4}.

- Cumulative ELCR for adult and child resident exposure to ground water (drinking) exceeds EPA's acceptable risk level of 1×10^{-4}; the non-cancer hazard index (HI) exceeds unity (one) for the adult and child resident ground water exposure scenario.

The BERA focused on particular species selected to represent the feeding guilds found within different foodwebs present in each EA. The results of the BERA indicate that contaminant levels present in the upland area surface soil and Big Walnut Run Creek do not pose an adverse risk to ecological receptors. However, there are unacceptable risks to ecological receptors exposed to surface water and sediment in the unnamed tributary and Pond D/E.

F. REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAOs) were established to address unacceptable human health and ecological risks, as identified through the risk assessment. The contaminated media posing unacceptable human health and ecological risks includes surface water and sediment in Pond D/E and the unnamed tributary and ground water at and adjacent to the Site. Although unacceptable human health risks are not identified for the process area soil, there are potential risks associated with leaching of COCs from the process area soil into ground water. Therefore, preliminary remediation goals (PRGs), as summarized in Table 3, were developed based on the EPA acceptable risk levels for the contaminated media posing the unacceptable and potential unacceptable risks.

Due to the presence of PAHs and free phase and residual NAPL in the saturated zones, EPA believes that it is technically impracticable (TI) to restore the contaminated ground water to meet the maximum contaminant levels (MCLs) and/or ground water PRGs within the reasonable time frame. A TI waiver is proposed so that restoration of the contaminated ground water to the drinking water standards will not be required for the Site. The following RAOs were developed for the contaminated media posing the unacceptable and potential unacceptable risks:

- **RAO No. 1 -** Prevent exposure to ground water containing COCs at concentrations exceeding the PRGs listed in Table 3, minimize dissolved phase plume expansion, and reduce the quantity of free phase and residual NAPL identified in the saturated zone to the extent practicable.
- **RAO No. 2 -** Prevent leaching of COCs from the surface and subsurface soil/sediment containing COCs at concentrations exceeding the respective PRGs listed in Table 3 into ground water and resulting in the COC exceedances of the ground water PRGs.
- **RAO No. 3 -** Prevent direct human (adolescent recreators) and ecological receptor contact with surface water and sediment containing COCs at concentrations exceeding the PRGs listed in Table 3 in the unnamed tributary and Pond D/E.
- **RAO No. 4** – Minimize the transport of COCs from the unnamed tributary into the down gradient surface water bodies (Big Walnut Run Creek and Neches River).

TABLE 2
Risk Characterization Summary
Hart Creosoting Company Superfund Site – Jasper, Texas

Exposure Area & Medium		Results (1)	Receptor	COCs
Upland Area Soil	SO2-1	ELCR = 4E-05, HI < 1	Worker	Not present above EPA's risk range
	SO2-2	ELCR = 2E-05, HI < 1		
	SO3-3	ELCR = 3E-06, HI < 1		
	SO3-4	ELCR = 6E-05, HI < 1		
	SO3-5	ELCR = 6E-06, HI < 1		
	SO3-6	ELCR = 2E-06, HI < 1		
	SO3-9	ELCR = 2E-06, HI < 1		
	SO4-1	ELCR = 4E-06, HI < 1		
	SO4-4	ELCR = 2E-06, HI < 1		
	SO5-1	ELCR = 1E-06, HI < 1		
Pond D/E Sediment		**ELCR = 2E-04**, HI < 1	Recreational Adolescent	CPAHs
Pond D/E Surface Water		ELCR = 7E-08, HI < 1	Recreational Adolescent	Not present above EPA's risk range
Big Walnut Run Creek Surface Water		ELCR = 8E-08, HI < 1	Recreational Adolescent	Not present above EPA's risk range
Unnamed Tributary Surface Water		ELCR = 3E-05, HI < 1	Recreational Adolescent	Not present above EPA's risk range
Unnamed Tributary Sediment		**ELCR = 1E-04, HI =4**	Recreational Adolescent	CPAHs, naphthalene
Ground water		ELCR = **1E-03**, HI = **540**	Residential Adult	PAHs, 2,4-dimethylphenol, 2-methylnaphthalene, benzene, carbazole, m & p-cresols, and dibenzofuran
		ELCR = **6E-04**, HI = **3700**	Residential Child	

Notes:

1. Bolded numbers exceed either an ELCR of 1E-04 or a non-carcinogenic HI of 1

TABLE 3
PRGs for Contaminated Media
Hart Creosoting Company - Jasper, Texas

COCs	Ground water PRG (mg/L)	Soil to Ground water PRG (mg/kg)	Surface Water PRG** (mg/L)	Sediment PRG (mg/kg)
2,4-Dimethylphenol	0.25	3.2	NA	NA
2-Methylnaphthalene	0.057	25	NA	0.54*
2-Methylphenol	0.66	7.1	NA	NA
3 &/or 4-Methylphenol	0.66	6.0	NA	NA
Acenaphthene	0.13	52	NA	0.121*
Acenaphthylene	NA	NA	NA	1.22*
Anthracene	NA	NA	NA	0.57*
Benzo(a)anthracene	0.000085	3.0	NA	1.17
Benzo(a)pyrene	0.0002	19	0.000099*	0.789
Benzo(b)fluoranthene	0.000052	6.3	0.000099*	0.976
Benzo(g,h,i)perylene	NA	NA	NA	0.28*
Benzo(k)fluoranthene	NA	NA	0.000099*	0.833
Carbazole	0.043	10.6	NA	NA
Chrysene	0.019	587	NA	2.02*
Dibenz(a,h)anthracene	0.0000033	0.63	NA	0.131
Dibenzofuran	0.005	4.3	NA	0.912*
Fluoranthene	NA	NA	NA	2.9*
Fluorene	0.087	66	NA	1.07*
Indeno(1,2,3-cd)-pyrene	0.000052	18	0.000099*	0.304
Naphthalene	0.1	15.6	NA	0.1
Phenanthrene	0.13	184	NA	3.4*
Pyrene	NA	NA	NA	1.97*
Benzene	0.005	0.039	NA	NA

Notes:

NA: Not Applicable (not a COC for the medium)
*: PRGs for protection of ecological receptors only.
**: Surface Water PRGs are the same as the Texas Surface Water Quality Standards.

G. SUMMARY OF REMEDIAL ALTERNATIVES

The Feasibility Study (FS) for the Site was prepared in accordance with the EPA guidance documents entitled Presumptive Remedies for Soils, Sediments, and Sludges at Wood Treater Sites (EPA, 1995) and Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground water at CERCLA Sites (EPA, 1995). Under the Superfund Accelerated Cleanup Model (SACM), presumptive remedies have been developed that are appropriate for specific types of sites and contaminants, based on extensive experience acquired from evaluation and remediation of these sites by EPA. Using presumptive remedies improves consistency, reduces costs, and increases the speed at which sites are remediated.

DEVELOPMENT OF ALTERNATIVES

Remedial actions must protect public health and the environment. Section 121(d)(2) of the CERCLA requires that Federal and state Applicable or Relevant and Appropriate Requirements (ARARs) be identified, and that response actions achieve compliance with the identified ARARs. This requirement makes CERCLA response actions consistent with pertinent Federal and State environmental requirements, as well as adequately protecting public health and the environment.

The remedial alternatives developed meet the RAOs and PRGs, in consideration of the ARARs. The alternatives were developed separately for contaminated soil/sediment and contaminated ground water to allow development of a wider range of alternatives and greater flexibility in selecting the preferred alternatives.

REMEDIAL ALTERNATIVES FOR CONTAMINATED SOIL/SEDIMENT

Combinations of general response actions and applicable treatment technologies have been assembled into possible remedial alternatives for the contaminated soil/sediment. These are:

- Alternative S-1: No Action
- Alternative S-2: Excavation and Disposal of PRG Exceedences into the Onsite Upgraded Containment Cell (UCC)
- Alternative S-3: Excavation and Disposal of PRG Exceedences into an Onsite RCRA Containment Cell (RCC)
- Alternative S-4: Excavation, Thermal Desorption to Meet Land Disposal Restrictions (LDRs), and Offsite Disposal
- Alternative S-5: Excavation, Thermal Desorption to Meet PRGs, and Reuse

Alternative S-1: No Action
Estimated Total Capital Cost: $0
Estimated Total O&M Cost: $0
Estimated Total Periodic Cost: $43,000
Estimated Total Present Worth: $43,000

Alternative S-1 constitutes the absence of any remedial actions. Under this alternative, the contaminated soil/sediment posing unacceptable risks to human health and the environment would be left in place. No action would be conducted at the site to protect human health and the environment, and no provisions would be included for institutional controls to restrict site access and future land use. Although this alternative does not meet any of the RAOs, it is considered in this evaluation as a baseline for comparison to other remedial alternatives, as required by the NCP.

Alternative S-2: Excavation and Disposal of PRG Exceedences into the Onsite UCC
Estimated Total Capital Cost: $4,353,000
Estimated Total O&M Cost: $390,000
Estimated Total Periodic Cost: $43,000
Estimated Total Present Worth: $4,786,000

Alternative S-2 assumes that the WC is protective of ground water and can continued being used to manage the creosote contaminated soil. This alternative would include implementing a drainage ditch to replace the portion of unnamed tributary that contains soil/sediment PRG exceedences; removing contaminated surface water in Pond D/E and the unnamed tributary and treating the surface water to meet the Texas Surface Water Quality Standards (TSWQSs) prior to disposal; excavating soil and sediment containing COCs exceeding the human health and ecological PRGs in the former process area, the unnamed tributary, and Pond D/E; expanding the WC to include the Pond D/E and an area northwest of the WC, disposal of excavated soil/sediment PRG exceedences into the expanded area and the top of the WC; upgrading the WC by covering the waste disposal area with RCRA Subtitle C landfill cover; and backfilling the excavations with clean soil or soil below the PRGs and re-vegetating the backfilled areas.

Because both the principal and low threat waste material would be left onsite, institutional controls, including access restrictions and enforceable land use restrictions, would be required to prevent breaching the UCC cover and development for residential use. Following the remediation, the conditions of the UCC cover will be visually inspected annually. Ground water monitoring will be necessary to evaluate the effectiveness of the UCC.

Alternative S-3: Excavation and Disposal of PRG Exceedences into the Onsite RCC
Estimated Total Capital Cost: $8,262,000
Estimated Total O&M Cost: $390,000
Estimated Total Periodic Cost: $43,000
Estimated Total Present Worth: $8,695,000

Alternative S-3 would include implementing a drainage ditch to replace the portion of unnamed tributary that contains soil/sediment PRG exceedences; removing and treating contaminated surface water in Pond D/E and the unnamed tributary; excavating soil and sediment containing COCs exceeding the human health and ecological PRGs in the WC, former process area, the unnamed tributary, and Pond D/E; disposal of excavated soil/sediment into an onsite RCRA Containment Cell (RCC) to be designed to meet RCRA subtitle C landfill requirements; backfilling the excavations with clean soil or soil below the PRGs and re-vegetating the backfilled areas.

Because both the principal and low threat waste material would be left onsite, institutional controls, including access restrictions and enforceable land use restrictions, would be required to prevent breaching the RCC cover and development for residential use. Following the remediation, the conditions of the CC cover will be visually inspected annually. Ground water monitoring will be necessary to evaluate the effectiveness of the RCC.

Alternative S-4: Excavation, Thermal Desorption to Meet LDRs, and Offsite Disposal
Estimated Total Capital Cost: $45,110,000
Estimated Total O&M Cost: $0
Estimated Total Periodic Costs: $43,000
Estimated Total Present Worth: $45,153,000

Alternative S-4 would be the same as Alternative S-3 with the exception that the soil/ sediment PRG exceedences excavated from the WC, process area, unnamed tributary, and Pond D/E will be disposed in an off-site disposal facility. Based on the Site characterization data, it appears that most of the soil/sediment PRG exceedences would exceed Land Disposal Restrictions (LDRs) and would require treatment to meet LDRs prior to offsite disposal. Under this alternative, a high temperature thermal desorption process will be used to treat the soil/sediment to meet LDRs and the treated and untreated soil/sediment that meet the LDRs will be disposed into an offsite RCRA subtitle C landfill. Because the low threat waste material will be left on site, institutional controls including enforceable land use restrictions will be required.

Alternative S-5: Excavation, Thermal Desorption to Meet PRGs, and Reuse
Estimated Total Capital Cost: $25,705,000
Estimated Total O&M Cost: $0
Estimated Total Periodic Costs: $43,000
Estimated Total Present Worth: $25,748,000

Alternative S-5 would be the same as Alternative S-4 with the exception that the soil/ sediment PRG exceedences excavated from the WC, process area, unnamed tributary, and Pond D/E will be treated onsite with a high temperature thermal desorption process to meet the PRGs and the treated soil/sediment will then be reused onsite as backfill material. Because the low threat waste material will be left on site, institutional controls including enforceable land use restrictions will be required.

REMEDIAL ALTERNATIVES FOR CONTAMINATED GROUND WATER

Combinations of general response actions and applicable ex-situ treatment technology types have been assembled into possible remedial alternatives for the contaminated ground water at the Site. These are:

- Alternative G-1: No Action
- Alternative G-2: Institutional Controls and Monitored Natural Attenuation
- Alternative G-3: Institutional Controls and NAPL/Hot-Spot Extraction
- Alternative G-4: NAPL/Hot-Spot Extraction and Plume Containment
- Alternative G-5: NAPL Removal, Plume Containment, and Enhanced In-situ Treatment

Alternative G-1: No Action
Estimated Total Capital Cost: $0
Estimated Total O&M Cost: $0
Estimated Total Periodic Cost: $65,000
Estimated Total Present Worth: $65,000

Alternative G-1 constitutes the absence of any remedial actions for the contaminated ground water. Under this alternative, no action would be conducted at the site to prevent COC migration, and no provisions would be included for institutional controls to restrict ground water use. Although this alternative does not meet the ground water RAO, it is considered in this evaluation as a baseline for comparison to other remedial alternatives, as required by the NCP.

Alternative G-2: Institutional Controls and Monitored Natural Attenuation
Estimated Total Capital Cost: $1,255,000
Estimated Total Long-Term Response Action (LTRA) Cost: $0
Estimated Total O&M Cost: $1,228,000
Estimated Total Periodic Cost: $65,000
Estimated Total Present Worth: $2,548,000

Alternative G-2 includes implementing institutional control for a designated technical impracticable zone (TIZ) to restrict ground water use and monitoring the contaminated ground water to estimate the natural attenuation rate and to determine if further actions will be required to prevent plume expansion. The main components of this alternative are:

Technical Impracticable Zone - Due to the presence of residual NAPL in the saturated multi-lithology zones and the presence of PAHs in the groundwater plume, it is technically impracticable to restore the contaminated ground water to meet the drinking water standards within a reasonable time frame. Therefore, a TI waiver will be invoked to wave the drinking water ARARs. To ensure continued protection of the public, a TIZ will be defined based on the extent of the ground water plume. EPA will make arrangements with the TCEQ, the City of Jasper and the Southeast Texas Ground Water Conservation District to prevent construction of new water supply wells within the TIZ. Institutional controls including a deed notice and restrictive covenants will be applied for the TIZ to ensure protective of human health.

Monitored Natural Attenuation - A ground water monitoring program will be implemented upon completion of soil/sediment remediation to evaluate the effectiveness of the selected remedy, to estimate the natural attenuation rate, and to determine if further actions will be required to control the ground water plume.

Alternative G-3: Institutional Controls and NAPL/Hot-Spot Extraction
Estimated Total Capital Cost: $2,440,000
Estimated Total LTRA Cost: $2,166,000
Estimated Total O&M Cost: $447,000
Estimated Total Periodic Cost: $65,000
Estimated Total Present Worth: $5,118,000

Alternative G-3 is identical to G-2 with the addition of a Zone P-2 NAPL recovery or hot-spot extraction system. Under this alternative, two to three vertical extraction wells will be installed, at the locations where free phase NAPL is identified, to remove recoverable NAPL. Since ground water will be co-extracted with NAPL, an oil-water separator (OWS) will be used to separate NAPL and contaminated ground water. The recovered NAPL will be transported to an offsite facility for incineration and the recovered ground water or OWS effluent will be injected at locations upgradient of the NAPL recovery wells, through vertical wells, to flush the residual NAPL and to increase the NAPL removal efficiency.

Alternative G-4: NAPL/Hot-Spot Extraction and Plume Containment
Estimated Total Capital Cost: $2,956,000
Estimated Total LTRA Cost: $3,198,000
Estimated Total O&M Cost: $1,238,000
Estimated Total Periodic Cost: $65,000
Estimated Total Present Worth: $7,457,000

Alternative G-4 is the same as alternative G-3 with the addition of a hydraulic containment system to prevent plume expansion if future investigation work determines that the plume is expanding. Under this alternative, two to three vertical ground water recovery wells will be installed at a location near the south boundary of the ground water PRG exceedences area to prevent expansion of the PRG exceedences area. The wells will be designed and operated to maintain a captured zone to hydraulically control the migration of COCs to the down gradient area.

Alternative G-5: NAPL/Hot-Spot Extraction, Plume Containment, and Enhanced In-situ Treatment
Estimated Total Capital Cost: $3,157,000
Estimated Total LTRA Cost: $3,612,000
Estimated Total O&M Cost: $1,238,000
Estimated Total Periodic Cost: $65,000
Estimated Total Present Worth: $8,072,000

Alternative G-5 will be the same as Alternative G-4 with the exception that the contaminated ground water separated from the OWS will be treated prior to injection. The ground water will be treated using an organic-clay/carbon filtration system to remove a portion of COCs from the contaminated ground water. Nutrients and hydrogen peroxide will then be added into the treated ground water, prior to injection, to enhance the in-situ bio-degradation of the COCs.

H. EVALUATION OF ALTERNATIVES

Provisions of the NCP require that each alternative be evaluated against nine criteria listed in 40 CFR 300.430(e)(9) to provide grounds for comparison of the relative performance of the alternatives and to identify their advantages and disadvantages. The following are the nine evaluation criteria: 1) Overall protection of human health and the environment, 2) Compliance with ARARs, 3) Long-term effectiveness and permanence, 4) Reduction of toxicity, mobility, or volume (TMV) through treatment, 5) Short-term effectiveness, 6) Implementability, 7) Cost, 8) Community acceptance, and 9) State acceptance.

The first two of the nine criteria are minimum, or "threshold," criteria that must be met by all alternatives. The next five criteria are considered "balancing" criteria and are the primary criteria upon which the detailed analysis is based. The last two criteria, considered to be "modifying" criteria, are deferred until the public comment process. Cost encompasses all engineering, construction, and O&M costs incurred over the life of the project. The assessment against this criterion is based on the estimated total present worth of these costs for each alternative and is expected to provide an accuracy of plus 50 percent to minus 30 percent.

CONTAMINATED SOIL/SEDIMENT

The following five alternatives were developed for the contaminated soil/sediment at the Site:

- Alternative S-1: No Action
- Alternative S-2: Excavation and Disposal of PRG Exceedences into the Onsite UCC
- Alternative S-3: Excavation and Disposal of PRG Exceedences into an Onsite RCC
- Alternative S-4: Excavation, Thermal Desorption to Meet LDRs, and Offsite Disposal
- Alternative S-5: Excavation, Thermal Desorption to Meet PRGs, and Reuse

Overall Protection of Human Health and the Environment
All the alternatives, with the exception of S-1, are protective of human health and the environment. Alternatives S-2 through S-5 are equally protective of human health and the environment in terms of meeting the RAOs and site-specific PRGs for the contaminated soil/sediment. All four alternatives would prevent inhalation, ingestion, or direct contact with human carcinogens in excess of established risk levels. As compared with the Alternatives S-3 to S-5, Alternative S-2 would have less protection for ground water because the UCC doesn't have a leachate collection system and the long-term effectiveness of the existing clay liner in the UCC is uncertain.

Compliance with ARARs and Long-Term Effectiveness and Permanence
As the contaminated soil/sediment posing unacceptable risks are left onsite without controls, Alternative S-1 will not comply with the ARARs. Alternative S-2 will not comply with the action specific ARAR because the existing clay bottom and slope liner in the UCC do not meet the RCRA Subtitle C landfill design requirements. The remaining alternatives can be designed and implemented to achieve the contaminant-specific, location-specific, and action-specific ARARs.

Long-Term Effectiveness and Permanence
Alternatives S-3, S-4, and S-5 would achieve long-term effectiveness and permanence through minimizing COC migration and eliminating potential future exposures. The onsite RCC for Alternative S-3 would require perpetual maintenance and institutional control to ensure long-term effectiveness. Alternative S-2 offers much less long-term effectiveness or permanence than Alternatives S-3, S-4, and S-5, because the existing clay liner in the UCC may not be sufficient in preventing the migration of COCs from the UCC into ground water. Alternative S-1 provides no long-term effectiveness or permanence.

Reduction of Toxicity, Mobility, or Volume through Treatment
Alternative S-5 offers the best reduction in TMV. Approximately 90,000 CY of soil/sediment will be removed and treated with a high temperature thermal desorption process. Alternative S-4 offers the next best reduction in TMV by treating excavated soil/sediment above LDRs and disposing of soil/sediment above PRGs in an offsite RCRA Subtitle C landfill. Although Alternatives S-2 and S-3 would not result in reduction of toxicity or volume, the two alternatives would provide a reduction in mobility by placing the contaminated material in a secured UCC or RCC. Alternative S-3 offers better reduction in mobility than Alternative S-2 because the leachate collection system and multilayer liner in the RCC provide better protection for ground water than the existing clay liner in the UCC. Alternative S-1 does not provide any TMV reduction.

Short-Term Effectiveness
Short-term risks originate from the construction required to implement the alternatives. Alternative S-1 has no short-term impacts. Alternative S-2 would provide the least short-term effectiveness because excavation is not required for the 65,000 CY of waste disposed in the WC. There would be

potential risks to construction workers in Alternatives S-2 through S-5, primarily associated with equipment movement and exposure to contaminated dust. Engineering controls would be implemented to control the exposure, and workers would be required to wear personal protection. Alternative S-3 would present short-term risk to the nearby residents and onsite workers due to staging of contaminated soil and construction of the RCC. Both Alternatives S-4 and S-5 present short-term risk to the nearby residents and onsite workers due to soil handling required for feed preparation and additional emissions from the onsite thermal desorption process.

Implementability

No administrative coordination of equipment, materials, or laboratory services is required for Alternative S-1. Alternative S-2 provides the most straightforward implementation action as the WC, which contains the largest amount of PRG exceedances, will be remain in place. Alternative S-3 through S-5 would be more difficult to implement than Alternative S-2 due to the uncertainties associated with excavation of the WC. Alternative S-3 would require construction of an onsite RCC. Equipment, material, and labor necessary to construct the onsite RCC are conventional and available. For Alternatives S-4 and S-5, the technology required to perform thermal desorption is widely used and accepted in the construction industry.

Costs

The cost of Alternative S-4 is significantly higher than the other alternatives. The highest cost associated with Alternative S-4 is due to the high treatment rate caused by use of the thermal desorption treatment process and the high transportation and disposal rate associated with long distant transport and offsite disposal of the treated materials. Alternative S-5 is much less expensive than Alternative S-4; however, the cost is based on the assumption that the contaminated soil/sediment can be treated to meet the PRGs. Alternative S-3 has a lower cost than Alternatives S-4 and S-5 because treatment is not required for onsite disposal of excavated material. Alternative S-2 is less expensive than Alternative S-3 since excavation and disposal of the contaminated soil in the WC will not be necessary under Alternative S-2. Alternative S-1 is the least expensive alternative.

CONTAMINATED GROUND WATER

The following five alternatives were developed for the contaminated ground water at the Site:

- Alternative G-1: No Action
- Alternative G-2: Institutional Controls and Monitored Natural Attenuation
- Alternative G-3: Institutional Controls and NAPL/Hot-Spot Extraction
- Alternative G-4: NAPL/Hot-Spot Extraction and Plume Containment
- Alternative G-5: NAPL/Hot-Spot Extraction, Plume Containment, and Enhanced In-situ Treatment

Overall Protection of Human Health and the Environment

The only significant risk associated with the contaminated ground water is the potential for the ground water to be used as a drinking water source in the future. All the alternatives, with the exception of Alternative G-1, are protective of human health, in that institutional controls prevent exposure to the ground water. The risk would decrease most quickly in Alternatives G-3 through G-5, and very slowly in Alternative G-2. Assuming the ground water plume is not stable, only Alternatives G-4 and G-5 would achieve the ground water RAO. Alternative G-3 would achieve the RAO relative to plume expansion much quicker than Alternatives G-1 and G-2, because removal of free phase and residual NAPL from the saturated zone would accelerate the plume stabilization.

Alternatives G-1 and G-2 would not achieve the ground water RAO.

Compliance with ARARs

MCLs and ground water PRGs are ARARs for the contaminated ground water at the Site. Based on the subsurface geologic conditions, the presence of free phase and residual NAPL in the saturated zones, and the physical-chemical properties of the ground water COCs, EPA believe's that it is technically impractical to restore ground water quality at the Site to meet ARARs. Consequently, EPA is proposing a technical impracticability (TI) waiver (see 40 CFR 330.430[f][l][ii][C] and EPA, 1996b). To ensure continued protection of the public, EPA will make arrangements with the State, the City of Jasper and the Southeast Texas Ground water Conservation District to ban construction of new water supply wells within the TIZ. This ban represents an institutional control to ensure that this potential exposure pathway is not complete. The TIZ and the proposed TI Waiver are included in the common elements that are a part of Alternatives G-2 through G-5. This means that none of the remedial alternatives proposed in the FS would achieve the contaminant specific ARARs for ground water within the TIZ.

Alternatives G-3 through G-5 will not require an ARAR waiver for re-injection of partially treated ground water co-extracted during NAPL removal because this action is allowable under RCRA section 3020 (b) (EPA Memorandum, December 27, 2000). Re-injection promotes a higher level of treatment throughout the NAPL source zone by flushing residual NAPL to the recovery wells for removal.

NAPL removal in Alternatives G-3 through G-5 would require RCRA-hazardous-waste-contaminated NAPL accumulation in containers for periods of more than 90 days. Consequently, RCRA container-labeling and storage requirements would be met as ARARs. In addition, RCRA treatment, storage and disposal requirements would be met by transporting manifested NAPL to a RCRA-compliant TSD facility.

Alternatives G-4 and G-5 are expected to comply with the ARARs related to treating contaminated ground water pumped from the containment system prior to discharge. Contaminated ground water would be treated to meet TSWQSs prior to discharging into Big Walnut Run Creek. The treatment system would be designed such that air emissions meet concentration and volume limits for discharge of COCs under the state exemption for remediation.

Long-Term Effectiveness and Permanence

Alternatives G-4 and G-5 provide the highest long-term effectiveness and permanence because the source (NAPL) removal coupled with the plume containment system would immediately achieve the RAO of preventing plume expansion and eventually reduce the ground water contaminant concentrations to MCLs or PRGs. Alternative G-5 offers better long-term effectiveness and permanence than Alternative G-4 as the enhanced in-situ bioremediation in Alternative G-5 is more effective than the natural attenuation in Alternative G-4. Since the residual NAPL is present in more than one saturated zone and PAHs are the major COCs at the Site, it is anticipated that the two alternatives would take decades to a hundred years to meet the MCLs or PRGs. Alternatives G-2 and G-3 would achieve long term effectiveness and permanence by eliminating potential future exposure; however, they would not be effective in achieving the RAO if the plume is not stable. Alternative G-3 would achieve the RAO much quicker than Alternative G-2 as the free phase and residual NAPL removal would reduce the COC concentrations and accelerate the plume stabilization. Alternative G-1 does not provide long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume through Treatment
Alternatives G-1 and G-2, do not include active treatment to reduce the toxicity, mobility or volume of contaminated ground water. Alternatives G-3 through G-5 all involve NAPL removal and treatment to reduce the toxicity, mobility, or volume of the free phase and residual NAPL in the saturated zone and each would remove the free phase and residual NAPL to the extent practicable and treat the recovered NAPL in an offsite incineration facility. Alternatives G-4 and G-5 would provide better TMV reduction than Alternative G-3 because the contaminated ground water extracted from the containment wells would be treated to meet the TSWQSs. In addition, Alternative G-5 would include using treatment to remove the COCs and injecting the treated ground water with hydrogen peroxide and nutrients into the remediation target area to enhance in-situ bioremediation.

Short-Term Effectiveness
Significant effects on workers, the community, or the environment during remedy implementation would not be expected for any of the five alternatives. Alternatives G-1 and G-2 would have the lowest short-term effectiveness because they rely solely on natural attenuation. Assuming the plume is not stable; Alternatives G-4 and G-5 would require the shortest time to achieve the ground water RAO. Alternative G-3 would require a longer period to achieve the ground water RAO than Alternatives G-4 and G-5.

Implementability
All alternatives are capable of implementation. There are no technical issues associated with implementation of Alternatives G-1 and G-2, and Alternatives G-3 through G-5 all involves technologies, services, and material that are readily available.

Costs
The costs of Alternatives G-4 and G-5 are significantly higher than Alternative G-3. The higher costs associated with Alternatives G-4 and G-5 are due to the long-term operation of the ground water containment and treatment system. Alternative G-2 is less expensive than Alternative G-3 since the installation and long-term operation of the NAPL extraction system is not included in Alternative G-2. Alternative G-1 is the least expensive alternative.

I. SUMMARY OF THE PREFERRED ALTERNATIVE

The preferred alternatives were selected based on the results of the detailed evaluation of all remedial alternatives and are considered to be the most appropriate for the Site. The preferred alternatives may be modified and the final alternatives adjusted slightly based on State and public comment.

CONTAMINATED SOIL/SEDIMENT

Alternative S-3, Excavation and Disposal of PRG Exceedences in the Onsite RCC, is recommended. Alternative S-3 provides the best balance among the alternatives with respect to the CERCLA evaluation criteria. As compared with other alternatives, Alternative S-3 provides better protection to human health and the environment than Alternative S-2 and is considered to provide the same level of protection as Alternatives S-4 and S-5. Alternative S-3 would include removal of 90,000 CY of contaminated soil/sediment posing a principal threat to human health and the environment and disposal of the contaminated material in an onsite RCC, which is designed to meet the RCRA Subtitle

C landfill requirements. This alternative would also minimize leaching of COCs into ground water.

Alternative S-2 has less short-term impact and lower construction cost than Alternative S-3; however, the bottom and slope clay liner in the proposed UCC may not be able to provide adequate protection for ground water. The overall protection provided by Alternative S-3 would overcome the higher short-term risk and higher cost associated with excavation of the WC and construction of the RCC. Although Alternatives S-4 and S-5 provide better TMV reduction and slightly better overall protection than Alternative S-3, the degree of TMV reduction and overall protection provided does not balance the high capital cost associated with the onsite thermal desorption treatment of the PRG exceedences (S-4 and S-5) and long distant transport and offsite disposal of the treated soil/sediment (S-4).

Alternative S-3 can be designed to achieve the contaminant-specific, location-specific, and action-specific ARARs and is effective and permanent because the contaminated soil/sediment posing principal threat to human health and the environment will be managed in an impermeable RCC. During the remedial action, short-term, health-related risks would be minimized through use of emission control techniques. Short-term nuisance noise impacts and safety-related risks to the community are anticipated to be minimal because the major construction and transportation activities are within the remediation target area. The short-term effectiveness, with respect to the time until the RAOs are achieved, is approximately 1 year. Alternative S-3 is estimated to cost $8,695K (total present worth) based on $8,262K total capital cost, $390K total annual O&M cost, and $43K total periodic cost.

CONTAMINATED GROUND WATER

Alternative G-3, Institutional Controls and NAPL/Hot-Spot Extraction, is recommended for contaminated ground water. Alternative G-3 provides the best balance among the alternatives with respect to the CERCLA evaluation criteria. This alternative provides reasonable protection of human health and the environment as the implementation of a TIZ will prevent future exposure to the contaminated ground water, and the free phase and residual NAPL in the saturated zone will be removed to the extent practicable.

Although Alternatives G-4 and G-5 would provide higher TMV reduction, greater long-term effectiveness, and better overall protection (assuming the plume is not stable), the degree of increase in the TMV reduction, long-term effectiveness, and overall protection does not overcome the high capital and O&M costs associated with implementation and long-term operation of the ground water containment and treatment system. Additional remedial actions can be readily added to Alternative G-3 if future ground water investigation results indicate that the ground water plume is not stable. Due to the presence of PAHs and NAPL (free phase and residual) in the saturated multi-lithology zones, it is technically impracticable to restore the contaminated ground water to meet the MCLs or ground water PRGs within a reasonable time frame. An ARAR waiver will be required for Alternative G-3 to establish a TIZ. Alternative G-3 is protective of human health and the environment, in compliance with or meets the requirements for a waiver of Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, is cost effective, and utilizes permanent solution and source (NAPL) removal technologies to the maximum extent practicable.

During the remedial action, short-term, health-related risks would be minimal because the major remedial activities are within the remediation target area and the construction worker will have minimal exposure to the contaminated media. The short-term effectiveness, with respect to the time until the RAOs are achieved, is estimated to be 10 years or until recoverable NAPL removed. Alternative G-3 is estimated to cost $5,118K (total present worth) based on $2,440K total capital cost, $2,166K total LTRA cost, $447K total O&M cost, and $65K total periodic cost.

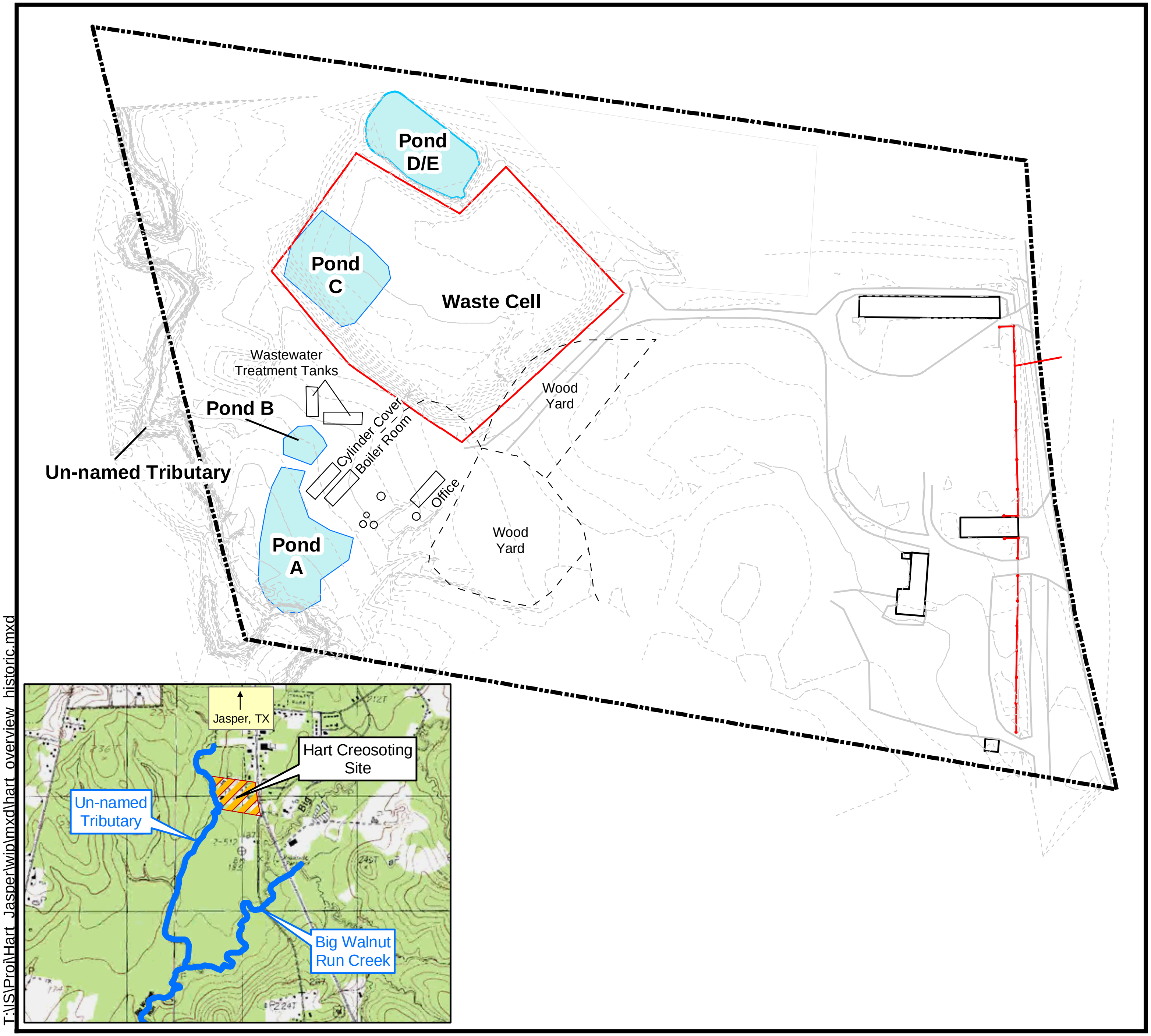
J. COMMUNITY PARTICIPATION

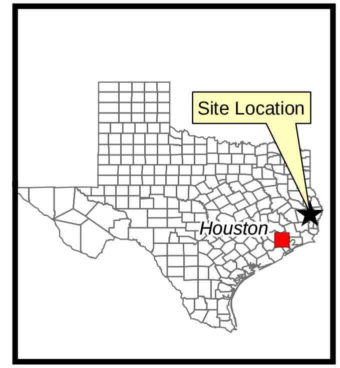
EPA and TCEQ provide information regarding the cleanup of the HCC Site to the public through public meetings, the administrative record file for the Site, and announcements published in the newspaper. EPA and the State encourage the public to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site through participating in this process.

For further information on the HCC Site, please contact:

Robert Sullivan
Remedial Project Manager
(214) 665-2223

U.S. EPA Region 6
1445 Ross Avenue
Dallas, TX 75202-2733
Toll free phone number 1-800-533-3508





LEGEND

- Site Boundary
- Fence
- Road Features
- Building
- Pond

0 100 200
Feet

Figure 1
Site Location and Layout Map

Hart Creosoting Company
Superfund Site
Jasper, Texas

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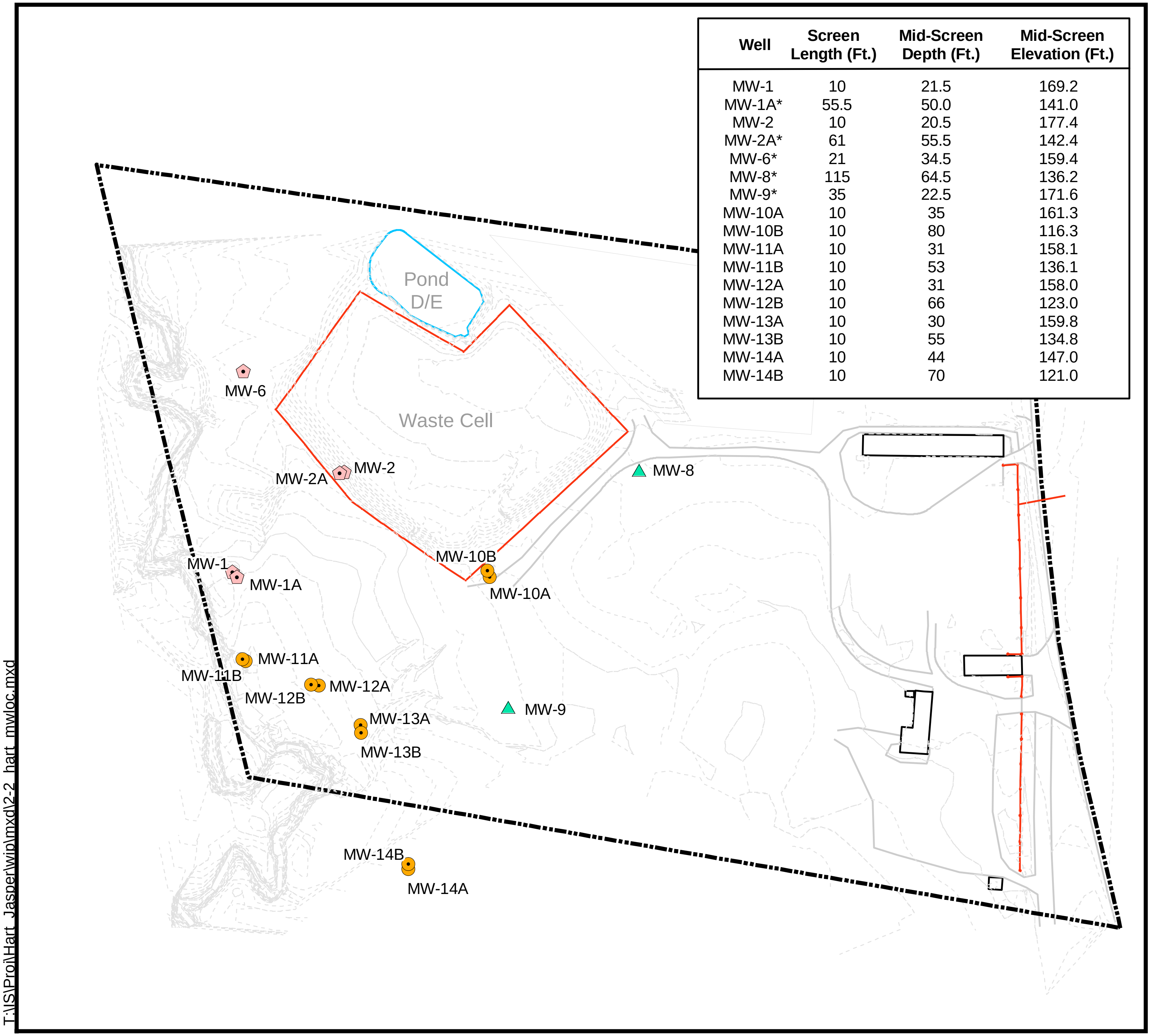
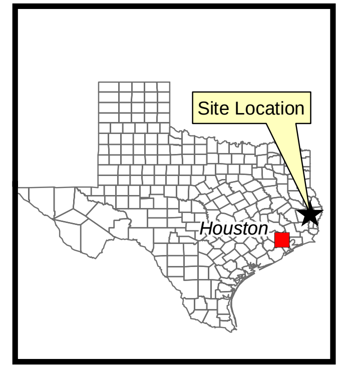


Well	Screen Length (Ft.)	Mid-Screen Depth (Ft.)	Mid-Screen Elevation (Ft.)
MW-1	10	21.5	169.2
MW-1A*	55.5	50.0	141.0
MW-2	10	20.5	177.4
MW-2A*	61	55.5	142.4
MW-6*	21	34.5	159.4
MW-8*	115	64.5	136.2
MW-9*	35	22.5	171.6
MW-10A	10	35	161.3
MW-10B	10	80	116.3
MW-11A	10	31	158.1
MW-11B	10	53	136.1
MW-12A	10	31	158.0
MW-12B	10	66	123.0
MW-13A	10	30	159.8
MW-13B	10	55	134.8
MW-14A	10	44	147.0
MW-14B	10	70	121.0



LEGEND

- New RI Monitor Well (2004)
- Existing EE/CA Monitor Well (2000)
- Existing RCRA Monitor Well (1985)
- Site Boundary
- Fence
- Road Features
- Building

0 100 200
Feet

N

Figure 2
Ground Water
Monitor Well Locations

Hart Creosoting Company
Superfund Site
Jasper, Texas

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